

U.S. Serial No. 10/666,356
Reply to Office Action of: April 17, 2006
Family Number: P2002J093 US2

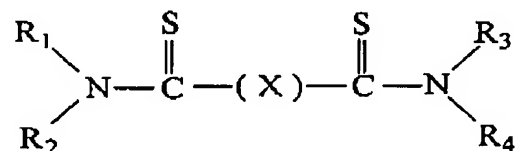
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AMENDMENTS TO THE CLAIMS

1. (Currently amended) A lubricating oil composition having extended life as evidenced by reduction in viscosity increase, oxidation and nitration when used in gas engine comprising:

- (a) a major amount of a base oil of lubricating viscosity;
- (b) a combination of neutral and overbased metallic detergents in an amount sufficient to provide a sulfated ash in the range of about 0.2 wt% to about 2.0 wt%;
- (c) based on the volume of the composition from about ~~0.00~~ 0.06 vol% to 0.15 vol% of a zinc dialkyldithiophosphate and about 0.1 vol% to 2.0 vol% of a zinc dialkyldithiocarbamate; and
- (d) from about 0.5 vol% to about 2.0 vol% of an ashless dihydrocarbylthiocarbamoyl antioxidant, or from about ~~0.0~~ 0.5 vol% to about 1.9 vol% of phenolic antioxidants, or from about 0.5 vol% to 3.0 vol% of mixtures thereof.

2. (Original) The composition of claim 1 wherein the dihydrocarbylthiocarbamoyl antioxidant is represented by the formula



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where R₁, R₂, R₃ and R₄ are the same or different and each represents an alkyl group of 3 to 30 carbon atoms, X represents S, S-S, S -(CH₂)_yS, S-CH₂CH₂(CH₃)-S and y is an integer of 1 to 3.

3. (Currently amended) The composition of claim 1 or 2 having a ~~phosphorous~~ phosphorus content of up to 0.008 wt%.

4. (Original) The composition of claim 3 wherein the base oil has a viscosity at 100°C of between about 5 to about 16 cSt.

5. (Currently amended) The composition of claim 4 including one or more gas engine oil additives selected from the group consisting of ashless dispersants, ashless antiwear additives, metal passivators, pour point depressants, ~~VI~~ Viscosity Index improvers and antifoamants.

6. (Currently amended) A method for enhancing the life of a lubricating oil composition as evidenced by a reduction in viscosity increase, oxidation and nitration when used in a stationary gas engine by adding to the oil a minor amount of additives comprising

- (a) a combination of neutral and overbased metallic detergents in an amount sufficient to provide a sulfated ash in the range of about 0.2 wt% to about 2.0 wt% based on the total weight of the composition;
- (b) based on the volume of the composition, from about ~~0.00~~ 0.06 wt% vol% to 0.15 vol% of a zinc dialkyldithio phosphate and about 0.1 vol% to 2.0 vol% of a zinc dialkyldithiocarbamate; and

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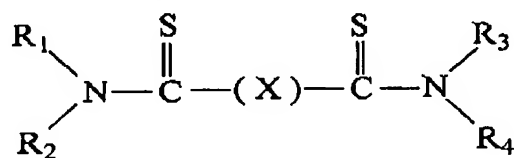
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- (c) based on the volume of the composition, from about 0.5 vol% to about 2.0 vol% of an ashless dihydrocarbylthiocarbamoyl antioxidant, or from about 0.0 0.5 vol% to about 1.9 vol% of phenolic antioxidants, or from about 0.5 vol% to 3.0 vol% of mixtures thereof.

7. (Original) The method of claim 6 wherein the dihydrocarbylthiocarbamoyl antioxidant is represented by the formula



where R_1 , R_2 , R_3 and R_4 are the same or different and each represents an alkyl group of 3 to 30 carbon atoms, X represents S, S-S, $S-(CH_2)_yS$, S- $CH_2CH_2(CH_3)_3$ -S and y is an integer of 1 to 3.

8. (Currently amended) The method of claim 7 wherein the lubricating oil has a ~~phosphorous~~ phosphorus content of up to 0.008 wt%.

9. (Original) The method of claim 8 wherein the base oil has a viscosity of about 5 to about 16 cSt at 100°C.

10. (Currently amended) The method of claim 9 wherein the lubricating oil includes one or more gas engine oil additives selected from the group consisting of ashless dispersants, ashless antiwear additives, metal passivators, pour point depressants, ~~VI~~ Viscosity Index improvers and antifoamants.